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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,990	02/06/2004	Robert K. Barr	52096	7094

EXAMINER
LEE, SIN J

ART UNIT	PAPER NUMBER
1752	

7590 12/14/2006  
EDWARDS & ANGELL, LLP  
P.O. Box 55874  
Boston, MA 02205

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/773,990

Applicant(s)

BARR ET AL.

Examiner

Sin J. Lee

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

#### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mooney, III et al (5,744,280) in view of Kuchta (5,112,721) (with Kneafsey et al (US 6,835,789 B1) which is being cited here to support the Examiner's assertion that Mooney's polymethylmethacrylate is a thickener), Nakamura (US 2002/0028404 A1) and Nakayama (JP 9-34110 and its JPO abstract).

Mooney, in his Example 2, teaches a photoimageable leuco dye/photooxidant composition containing acetone (present diluent), hexaarylbiimidazole, 9,10-phenanthrenequinone (present quinone compound) and triethanolamine triacetate

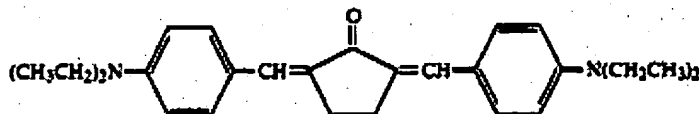
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(present acylester of triethanolamine). Mooney also teaches presently claimed color formers (see col.2, lines 54-67, col.3, lines 1-15). Mooney states (see abstract) that his deuterated leuco compound (such as deuterated aminotriarylmethane) has the extent of deuteration of *at least 60%*. Since Mooney *does not exclude* the presence of the non-deuterated color formers, and since "60%" is clearly disclosed as the lower end of the taught range, one skilled in the art would immediately be able to envisage having Mooney's leuco compounds that are 60% deuterated and 40% *non-deuterated*.

***Besides, present claims 1, 4, 7 and 8 do not exclude the presence of deuterated color formers since present claims are drawn to a composition "comprising . . ."***  
***(present rejection can be overcome by inserting a limitation which says that all of the color formers present in the present composition are non-deuterated).***

Mooney also teaches (col.6, lines 10-23) that his photoinitiating system (which includes hexaarylbiimidazole photoinitiator) can include sensitizers which are activated in UV, *visible* or near IR regions of the electromagnetic spectrum.

Kuchta teaches (see abstract and col.4, lines 9-68, col.3, lines 1-56, col.7, lines 53-57) an initiator system (that absorbs in the visible region), which includes a hexaarylbiimidazole, a sensitizer and a co-sensitizer, which specific example is shown in col.12 and also shown below;



Kuchta also teaches (col.9, lines 48-51) the amount of the co-sensitizer to be 0.01-0.2%, *which lies within the present range* of 0.005-10wt.% of claim 6. Kuchta states

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(col.2, lines 4-10) that his initiator system *simultaneously enhances both photospeed and image resolution*. Based on Kuchta's teaching (especially in view of the fact that Mooney is already using hexaarylbiimidazole and the fact that Mooney teaches that his photoinitiating system can include sensitizers), it would have been obvious to one skilled in the art to use Kuchta's initiator system, which includes a hexaarylbiimidazole and the co-sensitizer shown above (in the amount of 0.01-0.2%), in Mooney's Example 2 in order to enhance both photospeed and image resolution as taught by Kuchta.

Mooney does not teach present onium salts. However, it is known in the art, as evidenced by Nakamura (see [0065]) to use an onium salt (as an accelerator) together with a radical generator in order to enhance reactivity of the radical generator. Nakamura furthermore teaches (see [0071]) hexaarylbiimidazole compound (*which is used in Mooney*) as one of suitable radical generators that can be used together with an onium salt. As examples of the onium salt that can be used in combination with the radical generator, Nakamura refers to [0022]-[0049] of JP 9-34110 (Nakayama). Examples listed in those paragraphs include diphenyl iodonium chloride and diphenyliodonium hexafluorophosphate as well as sulfonium salts. It would have been obvious to one skilled in the art to use an onium salt such as diphenyliodonium chloride or diphenyliodonium hexafluorophosphate together with Mooney's hexaarylbiimidazole as taught by Nakamura and Nakayama in order to enhance reactivity of hexaarylbiimidazole. Also, Nakamura teaches that the onium salts can be used in the amount of 0.05-50 wt.% (see [0074]). Therefore, Mooney in view of Kuchta, Nakamura and Nakayama would render obvious present inventions of claims 1-6 and 13-16 (since

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Kuchta teaches the present amount of the photosensitizer claimed in present claim 6, it is the Examiner's position that Mooney's composition containing Kuchta's co-sensitizer in the amount of 0.01-0.2% would have sufficient amount of the sensitizer to affect a color or shade change in the imaging composition upon application of energy at intensities of 5mW or less as presently recited).

Mooney also teaches (col.7, lines 34-65) the use of polystyrene (present rheology modifier according to present specification, pg.13, second full paragraph) as well as polymethylmethacrylate (present thickener as evidenced by Kneafsey et al, col.8, lines 16-17) as his polymeric binders. Therefore, Mooney in view of Kuchta, Nakamura and Nakayama would render obvious present inventions of claims 7 and 11.

Mooney teaches (col.11, lines 54-62) that an actinic radiation of ultraviolet, visible, or infrared range can be used for the exposure step. Therefore, it would have been obvious to one skilled in the art to use a visible radiation for the exposure step with a reasonable expectation of forming color images. Therefore, Mooney in view of Kuchta, Nakamura and Nakayama would render obvious present inventions of claims 8-10 and 12 (see present specification, pg.16, lines 1-5).

### ***Response to Arguments***

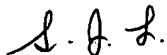
4. Applicants argue that Mooney teaches away from compositions which include only non-deuterated leuco dyes and that present invention does not include any deuterated leuco dyes. However, as discussed above, present claims are not drawn to composition which includes only non-deuterated leuco dyes, and present claims do not exclude the presence of deuterated leuco dyes.

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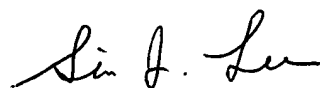
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee  
December 8, 2006



**SIN LEE**  
**PRIMARY EXAMINER**